

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

SEMICAPS PTE LTD,

Plaintiff,

v.

HAMAMATSU CORPORATION, et al.,

Defendants.

Case No. [17-cv-03440-DMR](#)

CLAIM CONSTRUCTION ORDER

Plaintiff SEMICAPS Pte Ltd. (“SEMICAPS”) filed this patent case against Defendants Hamamatsu Corporation, Hamamatsu Photonics K.K., and Photonics Management Corp. (collectively, “Hamamatsu”). SEMICAPS alleges that Hamamatsu infringes several claims of U.S. Patent No. 7,623,982 (the “’982 patent”), which relates to testing of electronic circuits using a laser. The parties dispute the construction of three terms. This order follows briefing, a technology tutorial, and a claim construction hearing pursuant to *Markman v. Westview Instruments, Inc.*, 517 U.S. 370 (1996).

I. BACKGROUND

A. The ‘982 Patent

SEMICAPS is the owner by assignment of the ‘982 patent titled, “Method of Testing an Electronic Circuit and Apparatus Thereof.” Compl. ¶ 11, Ex. A (‘982 Patent). The ‘982 patent was issued by the United States Patent and Trademark Office (“USPTO”) on November 24, 2009. It “relates generally to semiconductor processing, and more particularly to a method of testing an electronic circuit, as well as to a respective apparatus,” and is directed toward determining the location of defects on a semiconductor circuit. *See* ‘982 Patent 1:6-8.

The ‘982 patent describes the problem it seeks to solve. It explains that “conventional laser induced techniques generally involve using a scanned laser beam, typically in the infrared

frequency range, to stimulate integrated circuit failures which are sensitive to thermal or carrier stimulations.” ‘982 Patent at 1:16-19. These techniques include Optical Beam Induced Resistance Change (“OBIRCH”), Thermal Induced Voltage Alteration (“TIVA”), and Differential Resistance Measurement (“DReM”). *Id.* at 1:22-27. However, advances in integrated circuit technology, including “the use of more metallization layers and new low k inter-layer dielectric materials with lower thermal conductivity,” have reduced the laser coupling efficiency, which in turn reduces the detection sensitivity. *Id.* at 1:28-33. The inventors explain that “conventional approaches” to improve the detection sensitivity of laser induced techniques have not been entirely successful. For example, increasing the power of the laser beam used “in order to compensate for the reduced laser coupling efficiency . . . may not be desirable,” because “there may be potential laser induced damage on the integrated circuit under test when the power of the laser beam used is too high.” *Id.* at 1:38-49. Another approach is to use “a pulsed laser in conjunction with a lock-in amplifier,” which increases detection sensitivity. *Id.* at 1:50-52. However, lock-in amplifiers are “not used in a real-time integrated circuit testing environment” because “accurate calibration and fine control of the lock-in amplifier parameters is typically difficult to achieve in practice.” *Id.* at 1:62-67.

According to the specification, the ‘982 patent attempts to increase detection sensitivity in a laser-based fault detection system without increasing the power of the laser beam or using lock-in amplifiers. ‘982 Patent at 10:19-46. “The method comprises radiating a laser beam onto the electronic circuit, and determining a plurality of samples of a response signal output by the electronic circuit during the period when the laser beam is radiated.” ‘982 Patent, Abstract. A signal processor “process[es] the sample measurements of the response signal of the electronic circuit under test” by “accumulat[ing] the plurality of samples to generate a value, and then generat[ing] a test result based on the value generated.” ‘982 Patent at 3:65-4:2. Based on the generated value, a fault on the electronic circuit may appear as a bright spot, bright line, or bright area at a pixel location corresponding to the location of the fault on the electronic circuit. *Id.* at 4:16-24, 4:34-38, 5:12-16.

The ‘982 patent includes 25 claims. SEMICAPS alleges that Hamamatsu infringes at least

claims 4-8, 17, and 21-25. Claims 4-8 and 17 pertain to a method of testing an electronic circuit, while claims 21-25 describe a related apparatus.

B. Procedural History

SEMICAPS filed this lawsuit on June 14, 2017. On September 19, 2017, the court granted Hamamatsu's unopposed motion to stay the case pending inter partes review ("IPR") proceedings initiated by Hamamatsu challenging the validity of the '982 patent. [Docket No. 28.] The case resumed following the issuance of two Final Written Decisions by the Patent Trial and Appeal Board ("PTAB") in the IPR proceedings. [Docket No. 53-1 (Marton Decl., June 6, 2019) ¶¶ 4, 5, Exs. B (Final Written Decision in IPR2017-02110), C (Final Written Decision in IPR2017-02112).]

Hamamatsu then moved to dismiss the complaint, arguing that the asserted claims are invalid because they claim patent-ineligible subject matter. The court denied the motion on August 16, 2019. *See SEMICAPS Pte Ltd. v. Hamamatsu Corp.*, 393 F. Supp. 3d 802 (N.D. Cal. 2019), *reconsideration denied*, No. 17-CV-03440-DMR, 2019 WL 5722568 (N.D. Cal. Nov. 5, 2019).

C. Disputed Terms

The parties dispute the proper construction of three terms: "value," "another value," and "test result."¹ SEMICAPS asserts that these terms should be given their plain and ordinary meaning. Hamamatsu disagrees and proposes constructions for each of them. SEMICAPS proposes its own constructions in the event the court concludes that construction is necessary.

II. LEGAL STANDARDS

"The purpose of claim construction is to determine the meaning and scope of the patent claims asserted to be infringed." *O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1360 (Fed. Cir. 2008) (quotation omitted). Claim construction is a question of law to be determined by the court. *Markman*, 517 U.S. at 387. In construing disputed terms, the court first

¹ The parties originally asked the court to construe three additional terms: "control system," "measuring circuit," and "signal processor." They withdrew those terms shortly before the claim construction hearing. [See Docket No. 83.]

examines the claims themselves, because “[t]he claims define the scope of the right to exclude; the claim construction inquiry, therefore, begins and ends in all cases with the actual words of the claim.” *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1248 (Fed. Cir. 1998). “[T]he words of a claim are generally given their ordinary and customary meaning.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (quotation and citation omitted). “[T]he ordinary and customary meaning of a claim term is the meaning that the terms would have to a person of ordinary skill in the art in question at the time of the invention,” which is the “effective filing date of the patent application.” *Id.* at 1313. “That starting point is based on the well-settled understanding that inventors are typically persons skilled in the field of the invention and that patents are addressed to and intended to be read by others of skill in the pertinent art.” *Id.* “In some cases, the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges.” *Id.* at 1314. In such instances, claim construction may “involve[] little more than the application of the widely accepted meaning of commonly understood words.” *Id.*

In other cases, the meaning of a claim term to a person skilled in the art is not “immediately apparent.” *Id.* In those cases, the court must look to “sources available to the public that show what a person of skill in the art would have understood disputed claim language to mean.” *Id.* (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1116 (Fed. Cir. 2004)). The words in a claim are to be interpreted in light of the intrinsic evidence of record, which includes the words of the claims, the specification, and the patent’s prosecution history, if it is in evidence. *Id.* at 1314-17. “[T]he prosecution history . . . includes the reexamination history.” *Sonix Tech. Co., Ltd. v. Publ’ns Int’l*, 844 F.3d 1370, 1379 (Fed. Cir. 2017) (citing *Info-Hold, Inc. v. Applied Media Techs. Corp.*, 783 F.3d 1262, 1266 (Fed. Cir. 2015)) (discussing reexamination history, including patentee’s expert’s opinion, as part of intrinsic evidence). The Federal Circuit has instructed that “the specification ‘is always highly relevant to the claim construction analysis’ and “[u]sually . . . dispositive; it is the single best guide to the meaning of a disputed term.” *Phillips*, 415 F.3d at 1315 (quotation omitted).

In most situations, analysis of intrinsic evidence alone will resolve claim construction

disputes. *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1583 (Fed. Cir. 1996). “In such circumstances, it is improper to rely on extrinsic evidence.” *Id.* However, if an analysis of the intrinsic evidence fails to resolve ambiguity in a disputed claim term, courts may rely on “extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art.” *Phillips*, 415 F.3d at 1314 (quotation and citation omitted); *Vitronics*, 90 F.3d at 1583. Extrinsic evidence “consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises.” *Phillips*, 415 F.3d at 1317 (quotation and citation omitted). However, “it is entirely appropriate . . . for a court to consult trustworthy extrinsic evidence to ensure that the claim construction it is tending to from the patent file is not inconsistent with clearly expressed, plainly apposite, and widely held understandings in the pertinent technical field.” *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1309 (Fed. Cir. 1999). All extrinsic evidence should be evaluated in light of the intrinsic evidence. *Phillips*, 415 F.3d at 1319.

III. CONSTRUCTION OF DISPUTED TERMS

A. “value” and “another value”

SEMICAPS’s Proposed Construction	Hamamatsu’s Proposed Construction
“ value ”: plain and ordinary meaning. If construction is necessary, “a magnitude, quantity or number”	“a representation of the response signal output by the electronic circuit during the period when the laser beam is radiated”
“ another value ”: plain and ordinary meaning. If construction is necessary, “another magnitude, quantity or number”	“a representation of the response signal output by the electronic circuit during the period when the laser beam is not radiated”

Both parties cite to claim 21 as a representative example of how the disputed term “value” is used in the patent. Pl.’s Br. 5; Defs.’ Br. 5. Claim 21 is an independent claim and describes an apparatus. It states:

21. An apparatus, comprising:

a laser beam source, wherein the laser beam source radiates a laser beam onto the electronic circuit,

a control system operable to direct the laser beam source to dwell on a location on the electronic circuit,

a measuring circuit, wherein the measuring circuit determines a plurality of samples of a response signal output by the electronic circuit during the period when the laser beam is radiated, and

a signal processor, wherein the signal processor accumulates the plurality of samples to generate a **value**, and generates a test result based on the **value**.

‘982 Patent at 12:19-31 (emphasis added).

The term “another value” appears in claim 17, which depends from claim 1. Claim 1 states:

1. A method of testing an electronic circuit, comprising:

radiating a laser beam onto the electronic circuit,

determining a plurality of samples of a response signal output by the electronic circuit during the period when the laser beam is radiated,

accumulating the plurality of samples to generate a value, and

generating a test result based on the value.

‘982 Patent at 10:59-67. Claim 17 states:

17. The method of claim 1, wherein another plurality of samples of another response signal output by the electronic circuit during a period when the laser beam is not radiated is determined, the other plurality of samples is accumulated to generate **another value** and the test result is generated based on the value and the other value.

‘982 Patent at 12:4-9 (emphasis added).

SEMICAPS argues that the terms “value” and “another value” do not require construction because they are “not ambiguous or uncommon, and [are] readily understandable to the jury.”

Pl.’s Br. 14. In the alternative, it proposes that “value” should be construed as “a magnitude, quantity or number.” In support, it cites the Institute of Electrical and Electronics Engineers, Inc. (“IEEE”) Standard Dictionary of Electrical and Electronics Terms, which defines “value” as “the quantitative measure of a signal or variable.” [Docket No. 70 (Marton Decl. Oct. 14, 2019) ¶ 4, Ex. B.] It also cites the 2001 Websters New World Dictionary, which defines “value” in the context of math as “the quantity or amount for which a symbol stands.” *Id.* at ¶ 5, Ex. C.

SEMICAPS asks the court to construe “another value” as “another magnitude, quantity or number.” According to SEMICAPS, these definitions are consistent with how the terms are used throughout the ‘982 patent.

Hamamatsu argues that the court should reject SEMICAPS's reliance on dictionary definitions, noting that the Federal Circuit has cautioned courts not to elevate dictionaries above the specification in construing disputed terms. *See Phillips*, 415 F.3d at 1321-22 (courts may use dictionaries "to assist in understanding the commonly understood meaning of words," but "heavy reliance on the dictionary divorced from the intrinsic evidence risks transforming the meaning of the claim term to the artisan into the meaning of the term in the abstract, out of its particular context, which is the specification."). It proposes that "value" should be construed to mean "a representation of the response signal output by the electronic circuit during the period when the laser beam is radiated." Correspondingly, Hamamatsu argues that "another value" should be construed as "a representation of the response signal output by the electronic circuit during the period when the laser beam is not radiated." According to Hamamatsu, these constructions are proper given the claims and specification of the '982 patent. The court will first address the term "value" before turning to "another value."

Hamamatsu argues that a person of ordinary skill in the art would understand "value" as used in the '982 patent to mean "*a representation of the response signal output by the electronic circuit during the period when the laser beam is radiated.*" Hamamatsu rests its proposed definition on the language of claim 21. Claim 21 describes an apparatus that includes a measuring circuit that "determines a plurality of samples of a response signal output by the electronic circuit during the period when the laser beam is radiated," and a signal processor that "accumulates the plurality of samples to generate a value, and generates a test result based on the value." '982 patent at 12: 24-31. Based on the language of claim 21, Hamamatsu asserts that the "value" must be a representation of the response signal when the laser beam is radiated. Def.'s Br. 6. It argues that the specification confirms this construction because it "repeatedly and consistently" describes "value" in this manner, citing *GPNE Corp. v. Apple Inc.*, 830 F.3d 1365, 1370 (Fed. Cir. 2016). Def.'s Br. 7.

In *GPNE*, the Federal Circuit considered the claim term "node" as used in a patent for a two-way paging system. The term "node" appeared only in the claims and the abstract. It did not appear in the specification, which "exclusively refer[red] to the devices as 'pagers' or 'paging

units.” 830 F.3d at 1368. The district court construed the term “node” as a “pager,” applying that construction, a jury found no infringement. *Id.* at 1369. The Federal Circuit affirmed the construction, noting “that when a patent ‘repeatedly and consistently’ characterizes a claim term in a particular way, it is proper to construe the claim term in accordance with that characterization.” *Id.* at 1370. “[T]he words ‘pager’ and ‘pager units’ appear[ed] in the specification over 200 times, and, apart from the Abstract, the specification repeatedly and exclusively use[d] these words to refer to the devices in the patented system.” *Id.* The court found that the prosecution history further supported the construction of “node” as a type of “pager,” since the inventor “consistently and exclusively describe[d] the invention as a system of pagers.” *Id.* at 1371.

Here, Hamamatsu relies on *GPNE* in asserting that the ‘982 patent’s specification “repeatedly and consistently” describes the “value” as “a representation of the response signal when the laser beam is radiating or on.” It cites the following examples: the specification discusses the diagram at Figure 2 and states, “At 203 of FIG. 2, a plurality of samples of the response signal output by the electronic circuit is determined during the period when the laser beam is radiated. . . . At 205 of FIG. 2, the plurality of samples is accumulated to generate a value.” ‘982 patent at 4:58-64. Next, in discussing Figure 6, the specification defines “tON” as the “period when the laser beam is radiating” and explains that during tON, “the converted sample values are accumulated in order to generate a value.” *Id.* at 8:20-22. The specification also provides a specific equation for the “value generated” for Figure 6, where the input to the equation is “the plurality of samples [of the response signal] obtained during the radiating period.” *Id.* at 9:12-15 (“It can be seen from the above equation that the value generated (from the plurality of samples obtained during the radiating period, tON(603)) is represented by the accumulation of the term $S(x_i, y_i)(t) * \delta[t - (TPD + nmTS)]$.”).

Hamamatsu’s position is not persuasive. The patent demonstrates that Hamamatsu selected certain examples to support its preferred construction while ignoring others that are inconsistent with its construction. Under Hamamatsu’s construction, “value” refers solely to response signals, and is further limited to response signals that are obtained when the laser is on. However, the patent uses “value” to connote things other than response signals. For example, the

specification refers to an output voltage “value”: “[i]n this regard, the output voltage V_o for these interface circuits may have a positive value or a negative value.” ’982 patent at 6:1-2; *see also id.* at 5:59-61 (“The output voltage V_o has a value which [is] always greater than or equal to zero, i.e., a direct-current (d.c.) voltage.”). Elsewhere, the specification uses “value” to refer to the values of pixels of the image display: “[i]n one embodiment, the value generated is a pixel value (e.g., the brightness of the pixel) of a digital image,” *id.* at 5:7-9, and “[i]n such an embodiment, each sample value is converted to a value representing the brightness at the corresponding pixel location on the digital image,” *id.* at 8:17-19. Similarly, claim 15 uses the term “value” in a manner consistent with the foregoing; it refers to “the value generated” as “a pixel value of a digital image.” *Id.* at 11:44-45.

The specification also uses the term “value” in connection with the response signal regardless of whether the laser beam is on, or radiating: “Further, as shown in FIG. 5(b), during the period *when the laser beam is radiating* (or radiating period), the response signal takes a positive value only after a delay from the start of the radiating period. Similarly, during the period *when the laser beam is not radiating* (or non-radiating period), the response signal takes a negative value only after a delay from the start of the non-radiating period.” *Id.* at 6:34-41 (emphasis added). Similarly, the specification refers to voltage or current sample “values” without regard to whether the laser beam is radiating: “In this illustrative example, with the frequency of sampling being selected as about 20 MHz and the frequency of pulsing being selected as about 5 KHz, there would be about 4000 sample values obtained, with about 2000 sample values during the radiating period and about 2000 sample values during the non-radiating period.” *Id.* at 8:9-14 (discussing Figure 6).

As these examples demonstrate, contrary to Hamamatsu’s position, the patent uses the word “value” throughout the specification without limiting it to “a representation of the response signal” and without regard to whether the laser beam is radiating. Nor does Hamamatsu point to anything in the prosecution history to support its proposed construction. *See, e.g., GPNE*, 830 F.3d at 1371 (finding that inventor’s declaration “consistently and exclusively describ[ing] the invention as a system of pagers” supported construing “note” as a type of “pager”). Essentially,

Hamamatsu seeks to import a limitation from claim 21—“wherein the measuring circuit determines a plurality of samples of a response signal output by the electronic circuit during the period when the laser beam is radiated”—into the meaning of “value.” That approach is unsupported and inconsistent with the Federal Circuit’s guidance that “the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, *including the specification*.” *Phillips*, 415 F.3d at 1313 (emphasis added); *see also Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995), *aff’d*, 517 U.S. 370 (“Claims must be read in view of the specification, of which they are a part.”).

For the same reasons, Hamamatsu’s proposed construction of “another value” as “a representation of the response signal output by the electronic circuit during the period when the laser beam is not radiated” is inconsistent with the ‘982 patent’s specification. According to Hamamatsu, the language of claim 17 supports the conclusion that “another value” is generated from a plurality of samples taken when the laser beam is off, or not radiating. Notably, the only support it provides for this construction are the portions of the specification describing the embodiment captured by claim 17: “Further, according to one embodiment of the invention, another plurality of samples of another response signal output by the electronic circuit during a period when the laser beam is not radiated is determined. The other plurality of samples is then accumulated to generate another value, and the test result is generated based on the value and the other value.” ‘982 patent at 8:24-33 (discussing Figure 6); *see also id.* at 9:16-19 (“The other value generated (from the plurality of samples obtained during the non-radiating period, tOFF (605)) is represented by the accumulation of the term $S(x_i, y_i)(t) * \delta[t - (TDT + TPD + nmTS)]$.”). As with the term “value,” Hamamatsu asks the court to import the limitation of a specific claim—here, claim 17—into the term “another value,” citing only the specification’s description of the embodiment of claim 17 as support. As discussed at length above, the ‘982 patent differs from the patent-in-suit in *GPNE* because it does not “repeatedly and consistently” characterize the term “value” in the way that Hamamatsu asserts. Hamamatsu’s proposed corresponding construction of “another value” suffers from the same flaws.

In sum, the court concludes that Hamamatsu’s proposed constructions for the claim terms “value” and “another value” are unsupported. The court agrees with SEMICAPS that the terms “value” and “another value” require no construction and should be given their plain and ordinary meanings.

B. “test result”

SEMICAPS’s Proposed Construction	Hamamatsu’s Proposed Construction
Plain and ordinary meaning. If construction is necessary, “determination from the testing of an electronic circuit”	“determination of whether the circuit is faulty”

The disputed term “test result” appears in claim 21, which discloses an apparatus that includes “a signal processor, wherein the signal processor accumulates the plurality of samples to generate a value, and generates a **test result** based on the value.” ‘982 Patent at 12:28-31 (emphasis added).

SEMICAPS argues that the court need not construe the term “test result” because it is readily understandable by a jury and is a common, unambiguous term. If the court determines that construction is necessary, SEMICAPS proposes that it be construed to mean “determination from the testing of an electronic circuit.”

Hamamatsu proposes the following construction: “determination of whether the circuit is faulty.” In support, it contends that the ‘982 patent defines the term “test result” to describe a positive or negative “determination of whether a circuit is faulty,” and argues that the court should adopt that construction, citing *Edwards Lifesciences LLC v. Cook Inc.*, 582 F.3d 1322, 1334 (Fed. Cir. 2009).

The *Edwards* court affirmed the district court’s construction of the term “malleable” in four related patents relating to intraluminal grafts for treating aneurisms and occlusive diseases of the blood vessels without open surgery. 582 F.3d at 1324, 1334. The specification stated that “the wires ‘are maleable [sic] and may be bent into any desired shape, ie [sic] they are not resilient to any substantial extent so that they have to be physically expanded into contact with the aorta rather than expanding by virtue of their own resilience.’” *Id.* at 1334. The court held that the use of the

term “i.e.” in the specification “signal[ed] an intent to define the word to which it refer[red], ‘malleable,’ and that definition was not limited to the embodiment being discussed.” *Id.* Accordingly, it concluded that “in the context of the specification, malleable wires and resilient wires are mutually exclusive,” because “the specification define[d] ‘malleable’ to exclude any substantial resilience, and that definition over[ode] any ordinary meaning of the word ‘malleable’ that might allow for substantial resilience.” *Id.*

Here, Hamamatsu asserts that the use of the term “i.e.” in the following excerpt from the ‘982 patent’s specification signals the patentee’s intent to define the term “test result” as a “determination of whether a circuit is faulty”:

If one or more bright spots, lines or areas appear on the digital image of the electronic circuit generated, then the electronic circuit has one or more faults, and thus, *a negative test result is obtained (i.e., the electronic circuit is faulty)*. If no bright spot, line or area appears on the digital image of the electronic circuit, then the electronic circuit does not have a fault and thus, *a positive test result is obtained (i.e., the electronic circuit is not faulty)*.

‘982 patent at 5:18-24 (emphasis added). Not so. To begin with, unlike the use of “i.e.” in *Edwards* which signaled an intent to define a term for all embodiments of the invention, the use of “i.e.” in the cited portion of the ‘982 patent’s specification does not define the term “test result” for all purposes and embodiments. Instead, when read in full context, the “i.e.” relied upon by Hamamatsu merely prefaces the explanation that follows and is limited to the particular embodiment being described. Hamamatsu’s quoted language appears in the third paragraph of this larger contextualized discussion:

The method may further include generating a digital image of the electronic circuit using the value generated at the first location of the electronic circuit. In one embodiment, the value generated is a pixel value (e.g., the brightness of the pixel) of a digital image.

The digital image of the electronic circuit may then be analyzed, using visual inspection, for example. According to one embodiment of the invention, if there were a fault on the electronic circuit, the fault at a location on the electronic circuit may appear as a bright spot, a bright line, or a bright area on the corresponding pixel location of the digital image of the electronic circuit.

If one or more bright spots, lines or areas appear on the digital image of the electronic circuit generated, then the electronic circuit has one or more faults, and thus, a negative test result is obtained

(i.e., the electronic circuit is faulty). If no bright spot, line or area appears on the digital image of the electronic circuit, then the electronic circuit does not have a fault and thus, a positive test result is obtained (i.e., the electronic circuit is not faulty).

‘982 patent at 5:5-24.

Moreover, contrary to Hamamatsu’s construction, the “test result” in this embodiment does not by itself indicate whether the circuit is faulty. The specification describes a separate step of visual inspection and analysis of the test result (in this embodiment, examination and interpretation of the brightness of pixels in a digital image) to determine whether the electronic circuit is faulty: “[t]he digital image of the electronic circuit generated may then be analyzed, using visual inspection, for example.” ‘982 Patent at 5:10-11. The separate step of analyzing the image to determine whether the circuit is faulty is not required by claim 21, which describes “a signal processor, wherein the signal processor accumulates the plurality of samples to generate a value, and generates a test result based on the value.” ‘982 Patent at 12:28-31. Hamamatsu does not cite to anything in the specification or elsewhere that supports its construction that “test result” includes the process of analyzing and determining whether a circuit is faulty.

In sum, Hamamatsu has not shown that the patentee used the signal “i.e.” to “set[] out a definition and act[ed] as his [or her] own lexicographer” with respect to the term “test result.” *Thorner v. Sony Comput. Entm’t Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012) (listing exceptions to the rule that words of a claim are given their ordinary and customary meaning as understood by a person of ordinary skill in the relevant art). It also has not shown that the patentee expressly or impliedly disavowed the full scope of that term in the specification or prosecution. *See id.*; *see also Trustees of Columbia Univ. v. Symantec Corp.*, 811 F.3d 1359, 1364 (Fed. Cir. 2016) (a patentee may disclaim the scope of a claim term by implication). Accordingly, the court declines to adopt Hamamatsu’s proposed construction of “test result.” The court concludes that the term “test result” is readily understood by its plain and ordinary meaning and no construction is necessary.

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IV. CONCLUSION

For the foregoing reasons, the court concludes that the terms “value,” “another value,” and “test result” require no construction.

IT IS SO ORDERED.

Dated: April 23, 2020

